

Claims Listing:

1-104. (cancelled).

105. (currently amended) A [photonic] layered structure device, comprising:
a silicon based superlattice with a plurality of layers that form a plurality of repeating units, at least one of the layers being an active region layer with at least one rare earth ion, wherein at least a portion of the superlattice is made of substantially a Group III-V or II-VI material.

106. (previously amended) A structure for efficient excitation or de-excitation mechanisms of crystal field engineered rare-earth silicon-based superlattice, comprising:
a silicon semiconductor based superlattice that includes a plurality of layers that form a plurality of repeating units, at least one of the layers being an optically active layer with at least one species of rare earth ion;
a first layer of semiconductor material, and
a second layer of semiconductor material, wherein the superlattice is sandwiched between the first and second layers and the first and second layers each have a wider bandgap than the superlattice.

107.-108. (cancelled).

109. (previously amended) A silicon semiconductor based superlattice, comprising:
a silicon based superlattice with a plurality of layers that form a plurality of repeating units, at least one of the layers being an active region layer with at least one rare earth ion, at least a portion of the superlattice being made of substantially a Group III-V or II-VI material, wherein at least a portion of the plurality of layers are interleaved with a plurality of quantum wells.

110. – 113. (cancelled).

114. (new) The layered structure device of claim 105, wherein the device is a photonic device.